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**Christopher Beasley (CSH PhD '13) applies psychology to transformative education programs for the formerly incarcerated. See page 6.**

Photo by Meron Menghistab

DEPAUL UNIVERSITY
COLLEGE OF SCIENCE AND HEALTH

# A Decade of Purpose and Progress

The College of Science and Health (CSH) has undergone a metamorphosis since its launch 10 years ago. There has been tremendous growth in research accomplishments and the recruitment and retention of mission-driven faculty, staff and students. Increased support from alumni and friends has provided more opportunities to our students. I believe this growth will continue, driven by our collective momentum, enthusiasm and commitment to our mission.

Our ongoing 10th anniversary celebration includes events that project CSH's purpose and vision, span the full range of our programs, speak to graduates and future students, and represent our commitment to engaging scientists and researchers in social justice. Visit our 10th anniversary website to learn about lectures, symposia, exhibits and community engagement activities hosted by various departments. You can also visit and subscribe to the CSH YouTube channel to view exciting presentations from these events.

As we celebrate the CSH community, we encourage you, our alumni, to send news of your accomplishments to scientia@csh.depaul.edu. Our community is strengthened through your efforts as leaders, advocates and change agents across science and health disciplines. The anniversary celebration is an opportunity to emphasize the importance of these connections, as well as showcase the college's strategic goals and their alignment with vital fundraising priorities. Learn about areas where your help is needed, and consider supporting the college with a gift today.

The pages that follow highlight ways in which faculty, staff, students and alumni are meeting the needs of many communities, from School of Nursing students and faculty volunteering in the COVID-19 vaccination effort to alumnus Christopher Beasley (CSH PhD '13) reimagining transformative college education programs for the formerly incarcerated. Such efforts and countless other outcomes and accomplishments further establish CSH as a trailblazer in the global science and health community, and a champion of diversity, equity and inclusion.

As dean, I will continue to build on CSH's successful foundation and identify opportunities that expand our footprint at DePaul and beyond. That includes the launch of new programs—speech language pathology, occupational therapy, engineering, a Bachelor of Science in Nursing—as well as other innovative, relevant science and health-focused programs.

I welcome your feedback as we move forward, and appreciate your exceptional level of support. Please contact me at sdanceba@depaul.edu to discuss any issues or potential opportunities that advance our mission.

Stephanie T. Dance-Barnes

Stephanie Dance-Barnes, PhD
Dean, College of Science and Health

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# Alumna Wins Gordon Bell Special Prize

Anda Trifan (CSH '12), a doctoral student in computational biophysics at the University of Illinois, Urbana-Champaign who also works at Argonne National Laboratory, was part of a multi-institution research team awarded the Gordon Bell Special Prize for High Performance Computing-Based COVID-19 Research by the Association for Computing Machinery. Scientists examined SARS-CoV-2 spike protein dynamics, using artificial intelligence and supercomputing resources to learn how the virus infiltrates the human immune system, setting off a viral chain reaction throughout the body.

Anda Trifan earned her BS in chemistry at CSH.

DePaul University/Randall Spriggs

Nursing student Sandy Ho administers a COVID-19 vaccine.

# Vaccination Site Volunteers

In late February, more than 150 School of Nursing students and 20 faculty members began volunteering at Chicago Department of Public Health sites to help vaccinate individuals as part of the city's COVID-19 vaccination effort. Volunteers have served at points of distribution as well as clinical sites and hospitals.

# Women in Science Lecture

On April 28, Lise Eliot, professor of neuroscience at the Chicago Medical School of Rosalind Franklin University, gave the inaugural William J. Degutis Women in Science and Health Lecture, presented virtually this year, as part of CSH's 10th anniversary celebration. Eliot debunked popular myths about brain differences among sexes that are used to rationalize gender gaps in STEM advancement and leadership. Eliot discussed nonbinary neuroplasticity and addressed the interaction between nature and nurture in shaping children's brain and gender development.

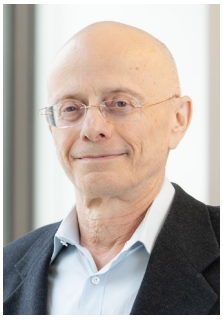
# New Scholarships

Three new scholarships supporting CSH students received matching funds through the Hay Endowed Scholarship Challenge authorized by the estate of the late William E. Hay (MBA '66), a former DePaul Trustee. The Dr. Mary Ellen Olbrisch Endowed Scholarship in the Health Sciences, Terry McCollister Endowed Scholarship in Nursing (established in her memory by Trish and Sam Cordes) and Judith Regnier Getch Endowed Scholarship in Environmental Science and Studies provide recognition and financial assistance to undergraduate students enrolled in health sciences, nursing and environmental sciences programs who are in good academic standing and have financial need.

Joanna Buscemi and Julia Lippert researched racial health disparities.

# "Unequal Cities" Research

Joanna Buscemi, assistant professor of psychology, and Julia Lippert, assistant professor of health sciences, contributed to "Unequal Cities" projects as members of the first cohort of Sinai Urban Health Institute-DePaul Research Fellows. The collaborative program between DePaul and Sinai Health System assesses health and social inequities in 30 U.S. cities, including Chicago, and translates research into scalable actions. Lippert's and Buscemi's co-authored study analyzed data about the racial health disparities in influenza and pneumonia mortality. Another study Buscemi co-authored assessed trends and racial inequities in diabetes mortality.



CSH faculty Elizabeth LeClair, Caitlin Karver and Leonard Jason

# National Institutes of Health Grants

Elizabeth LeClair, professor of developmental biology, received a $454,896 grant for a motility analysis of L-plastin mutant zebrafish. Caitlin Karver, associate professor of medicinal chemistry, was awarded a $437,912 grant to research the biological roles of inflammatory caspases through chemical approaches. Leonard Jason, professor of clinical and community psychology, received a $282,699 grant to research behavioral and biological risk factors predisposing patients to developing COVID-19, reinterviewing young adult participants from a related, ongoing study regarding symptoms of mononucleosis and chronic fatigue syndrome.

# All Hands on Deck

## Inspired pandemic approaches showcase interdisciplinary acumen in action

Associate Professor of Physics Eric Landahl (not pictured), his wife, Sarah Rice (far left), and their Illinois PPE Network collaborators have installed protective plastic barriers in school buses, starting with the Menominee Nation's fleet in Wisconsin.

CSH kicked off its 10th anniversary event series with its "What Must Be Done? Learning From the COVID-19 Pandemic to Strengthen Our Future" symposium on March 10. Excerpts from faculty presentations highlighting the college's interdisciplinary pandemic response follow. Learn more and watch a video of the symposium on CSH's YouTube channel.

### Sarah Connolly, associate professor of health and biological sciences

"Going so quickly from discovering the virus to having vaccines that work so well is mind-boggling. But a lot of background research was done after SARS on other coronaviruses, spike proteins and using mRNA as a vaccine, so scientists were ready.

"The fear is that this virus will continue to change and we'll have to keep chasing it with vaccines, but that may not be the case. The virus has only had a year to pick up mutations, adapt and spread in humans. It's possible it will reach a pinnacle and just stay there. We haven't seen a variant that requires us to make a new vaccine yet.

"It isn't hard for Moderna, for instance, to make a vaccine against the B.1.1.7, the one from the U.K., just by changing a few letters in their vaccine technology. We'll be prepared if we need to give boosters for a variant, but I still have hope this virus can be taken care of just by vaccinating a large percentage of our population."

### Desale Habtzghi, associate professor of mathematics

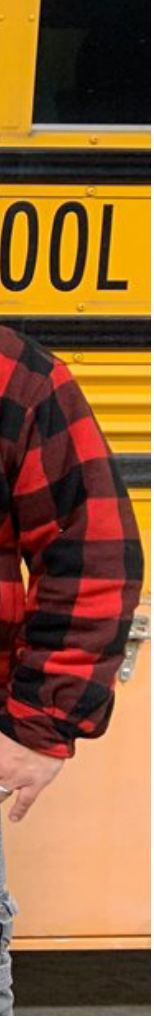
"Vaccine efficacy and effectiveness are not the same thing. Efficacy, or relative risk, is defined as a performance of the vaccine under a controlled situation like a clinical trial. An efficacy trial can often overestimate an intervention's effect when implemented in clinical practice.

"Effectiveness is the performance of the vaccine under real-world conditions, which could be affected by variables like storing a vaccine at the wrong temperature, virus variants or having an unskilled practitioner vaccinate you. No vaccine is 100% effective.

"People see a number, like Pfizer's 95% vaccine efficacy, and think 95% of the people are protected from disease with the vaccine. It's not like that, but it is an astonishing result. What it means is those who took the vaccine had a 95% reduction in risk of having symptomatic COVID-19 infection compared to those who did not take the vaccine. The real vaccine efficacy for Pfizer is somewhere between 90% to 97%, a range we call a credible or confidence interval."

### Anne Saw, associate professor of clinical-community psychology

"U.S. Rep. Karen Bass came up with the idea of doing a needs assessment to drive policymaking around COVID-19 relief. Researchers were asked to form




**"VACCINE EFFICACY AND EFFECTIVENESS ARE NOT THE SAME THING."**

–Desale Habtzghi

teams representing our communities, in my case Asian Americans, Native Hawaiians and Pacific Islanders. Our work has a direct line to policymakers who can bring change to communities of color the pandemic has disproportionately impacted.

"We're surveying 6,300 individuals across the country to ask about economic impact, job loss, housing and food security, educational disruption, access to health care, mental health status and rising anti-Asian racism. We're following up with 1,400 respondents to the Stop AAPI Hate incident-reporting portal.

"Asian Americans have the highest joblessness rates during the pandemic. Native Hawaiian and Pacific Islanders have higher infection and death rates than Black and Latinx Americans. Because their populations are small and not spread across the U.S., they're not covered by the media, and public health departments haven't adequately documented rates. COVID is highlighting long-standing disparities."

## Shannon Simonovich and Kashica Webber-Ritchey, assistant professors of nursing

**Shannon Simonovich:** "In our large-scale qualitative research study,* we interviewed 100 nurses across the country during the pandemic's first wave. The purpose was to capture the nursing experience, advocate for nurses' needs and make working as a nurse safer. Our colleagues on the front lines were feeling overwhelmed, experiencing fear, and felt unprepared to care for COVID-positive patients."

**Kashica Webber-Ritchey:** "We tried to match each with a nurse interviewer who worked in a similar clinical background and shared a racial or ethnic background. Our team includes 14 doctorally prepared nurses and 10 graduate and undergraduate research assistants."

**Shannon Simonovich:** "Communication was the biggest takeaway. You can adapt to changing protocols, policies and supplies if you feel you have appropriate communication and support. We also talked about moral distress. Every single nurse said they'd cope with it later, but you can only put off fear, frustration, powerlessness and guilt for so long.

"We're sharing our findings in the International Nursing Review's special issue on COVID-19 and with institutions worldwide, including during Sigma Theta Tau's 32nd International Nursing Research Congress in July 2021."

Kashica Webber-Ritchey

Desale Habtzghi

Shannon Simonovich

## Eric Landahl, associate professor of physics and astrophysics

"Our Illinois PPE Network is providing health care providers at COVID-19 vaccination sites with antifog goggles our makers designed.

"We're also helping elementary schools reopen by installing plastic barriers between seats in school buses, especially in places where that's the only way kids get to school. We've been working with underserved and hard-hit populations.

"We just finished outfitting the 175-bus fleet for the Menominee Nation's elementary students in Wisconsin to bring them in line with CDC guidelines. The schools provide a huge amount of social services in those communities. The Nation was concerned because a professional job on each bus costs $5,000 to $10,000. Acrylic plexiglass is in demand and expensive. We devised a solution using thinner plastic donated by Coca-Cola and other donors. We're also contacting school districts in Illinois, hoping to do more and get more raw material."

* Funded by Zeta Sigma Chapter of Sigma Theta Tau International, Illinois Nurses Foundation and DePaul's College of Science and Health and School of Nursing

# Unlocking Potential

Christopher Beasley thinks psychology is key to academic transformation for the formerly incarcerated

Photo by Meron Menghistab courtesy of University of Washington Magazine

Assistant Professor of Community Psychology Christopher Beasley (CSH PhD '13) on campus at the University of Washington, Tacoma

Growing up underprivileged in the small, rural town of Casey, Ill., Christopher Beasley (CSH PhD '13) turned to the illegal drug trade as a support system.

"I never imagined many possibilities in my life or thought about college," says Beasley, now an assistant professor of community psychology at the University of Washington, Tacoma (UW Tacoma), where his work focuses on improving transitions to higher education for formerly incarcerated individuals. "I looked at it as a way to have self-respect and respect from others and provide resources to my community."

After serving a prison sentence for drug possession, Beasley heeded his uncle's advice and earned an associate degree at a community college, exploring bachelor's degree completion options through a federal TRIO program supporting low-income, first-generation students. He earned a bachelor's degree in psychology from the University of Minnesota, Duluth, a master's in clinical psychology from Roosevelt University and a PhD in community psychology from DePaul.

"I'm interested in how education programs in prison and postprison shape the possibilities people see for themselves," says Beasley, who founded and directs UW Tacoma's Post-Prison Education Research Lab. "We examine how the programs transform one's [sense of] self by viewing personal narratives through a larger theoretical lens."

DePaul provided a pivotal stage in Beasley's own narrative. At CSH, he worked part time in the college's Center for Community Research with its director, Leonard Jason, and another community psychology professor, LaVome Robinson. Beasley helped draft the proposal that later led to Jason and Robinson receiving a $6.6 million research grant from the National Institute of Mental Health for the center's Success Over Stress Violence Prevention Project.

Beasley also collaborated with two other formerly incarcerated PhD students on the center's staff to develop a grassroots network he'd initiated at Roosevelt. Today, the Formerly Incarcerated College Graduates Network comprises about 1,400 individuals, including 130 with doctoral degrees, in the United States and seven other countries. The network provides mutual support, mentors and a means to transform the social narrative collectively.

At UW Tacoma, Beasley also helps coordinate the Husky Post-Prison Pathways scholarship program and develops research studies to follow such students over their academic careers. "Only 4% of formerly incarcerated people get bachelor's degrees," says Beasley. "Many universities focus on equity and inclusion, and here is a group for whom the equity numbers could not be more apparent."

Shifting the focus from generalizations to individual needs is key.

"Too often rehabilitation and reentry focus on mitigating risk factors—providing housing and jobs, for instance, when people get out," says Beasley. "But having those things won't always lead you to a more meaningful life. It's critically important that we look at what people need in life to flourish, to be part of a community, and support that pathway. That's why prison and postprison education is so important. For me, that was how I discovered [how to] fit into the world."

Bridget Tenner goes to pieces solving problems in cutting-edge mathematics

# Puzzle Master

Bridget Tenner, a professor of mathematics at CSH, loved logic puzzles when she was a kid. After learning such challenges, similar to sudoku, belong to the branch of mathematics known as combinatorics, she made it her job to discover order in the seeming chaos of the discipline's divergent constructions.

"The logic puzzles and games I loved growing up may not have arithmetic in them, but the reasoning and processes involved are very mathematical," says Tenner. "These were the seeds of the kind of math I fell in love with. I always thought of them as puzzles and games. They were problems that were easy to state and hard to solve."

Combinatorics involves enumeration, combinations or permutations to solve problems about how to arrange objects that satisfy specific conditions within a finite or discrete system. It evolved over centuries from simpler forms, including recreational puzzles, but during the latter part of the 20th century, it emerged as one of mainstream mathematics' most exciting fields. Combinatorics was partly driven by computer science and algorithmic methods for solving real-world problems, and its applications extend to many other fields, including algebra, topology, probability and statistical physics.

"A very basic problem might be stated as 'How many ways are there to move a pawn across a chessboard?' But you can get much more complicated and say, 'How many ways are there to cover a certain region with little tiles?'," says Tenner. "You're understanding these patterns and how they have to fit together and the structures underlying them."

One real-world situation to which Tenner and a colleague have applied their unique insight involves gerrymandering. They argue that instead of employing tools from continuous mathematics, which have been commonly used to analyze legislative district maps, discrete mathematical tools should be the standard.

"Districts are discrete objects and should be studied with an entirely different toolbox," says Tenner.

A prominent theme in Tenner's current research centers on permutations and partially ordered sets. "It's about tying the appearance or absence of patterns to certain characteristics of a larger picture when you have incomplete information and only some objects to compare," says Tenner.

Professor of Mathematics Bridget Tenner

In February 2020, Tenner presented a study of pinnacle and peak sets of permutations at the Royal Swedish Academy of Sciences' venerated Institut Mittag-Leffler, which annually invites leading mathematicians from around the world to share work, network and study without distraction. Pinnacles, she explains, relate to patterns of numbers that correlate, colloquially speaking, to mountaintops.

While at the institute, Tenner started working with two Italian mathematicians on a problem that had come up in their work, and to which her own research proved pivotal.

"It turned out to have quite an elegant solution," says Tenner. "In mathematics, that's one of the things you most hope for."